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7) GOF

Ho: the police officers races fit the ethnic distribution of the city

8) GOF

Ho: murders among women fit the distribution of murder weapons

10) GOF

Ho: the digits of pi are uniformly distributed

13) Independence

Ho: Breastfeeding is independent of having an epidural

14) Homogeneity

Ho: the use of stats is consistent throughout the years

23) Either! Independence or Homogeneity

Ho: Survival and class are independent

Ho: Survival distribution is the same amongst all classes

24) Homogeneity

Ho: The distribution of gender is the same at all ranks

23)

(a) $P(\text{crew}) = 885/2201 = 40.21\%$

(b) $P(3\text{rd n Survived}) = 178/2201 = 8.09\%$

(c) $P(\text{survive} | 1\text{st class}) = 202/325 = 62.15\%$

(d) expected for alive crewmen = $\frac{(710)(885)}{2201} = 285.48$

(e) H_0 : There is no association between class and survival

H_a : There is an association between class and survival

(f) $df = (2-1)(4-1) = 3$

(g) We reject H_0 b/c $p\text{-value} < \alpha = 0.05$. We have sufficient evidence that there is an association between class and survival.

23) If you did the full test...

Ho: There is no association between class and survival

Ha: There is an association between class and survival

$$\chi^2 = \sum \frac{(\text{obs} - \text{exp})^2}{\text{exp}} = \frac{(212 - 285.48)^2}{285.48} + \frac{(202 - 104.84)^2}{104.84} + \dots =$$

$$\chi^2 = 187.79$$

$$P(\chi^2 > 187.79 | df = 3) = 1.829 \times 10^{-40}$$

We reject Ho b/c p-value $1.829 \times 10^{-40} < \alpha = 0.05$. We have sufficient evidence that there is an association between class and survival.

29) (a) Independence

(b) H_0 : There is no association between gender and political party

H_a : There is an association between gender and political party

(c) Conditions:

1- Categorical data

2- SRS

3- All expected cell counts ≥ 5

1- gender and political party are categorical

2- assumed representative

3- all exp cell counts ≥ 5

lowest = ≥ 5

conditions met $\rightarrow \chi^2$ distribution \rightarrow

χ^2 test for Independence

$$(d) \chi^2 = \sum \frac{(\text{obs} - \text{exp})^2}{\text{exp}} = \frac{(36 - 43.663)^2}{43.663} + \frac{(45 - 40.545)^2}{40.545} + \dots =$$

$$\chi^2 = 4.851$$

$$P(\chi^2 > 4.851 \mid df = 2) = 0.0884$$

(e) We fail to reject H_0 b/c p-value of $0.0884 > \alpha = 0.05$. We have sufficient evidence that there is no association between gender and political party.